

Claims

Fig 617
Sub A11

1. A piezoelectric transformer comprising a piezoelectric transformer body including a piezoelectric ceramics rectangular plate, a pair of first electrodes formed on at least one of top/bottom surfaces and both side surfaces of an approximate half of the transformer body in its longitudinal direction, and at least one second electrode formed on at least one of side surfaces and an end surface of the other approximate half of the transformer body in its longitudinal direction, wherein the piezoelectric transformer is mounted on a circuit board with a power supply circuit component mounted thereon to drive the piezoelectric transformer, the second electrode being provided with a plurality of terminals each of which is connected to said circuit board.

2. A piezoelectric transformer as claimed in claim 1, wherein said piezoelectric transformer body preferably comprises either one of a layered structure formed by alternately stacking a plurality of inner electrodes and a plurality of piezoelectric ceramic layers in a thickness direction, or a single piezoelectric ceramics layer.

3. A piezoelectric transformer as claimed in claim 2, wherein said piezoelectric transformer and said circuit board are electrically connected by at least one of a lead wire and a FPC.

Sub A2

4. A piezoelectric transformer as claimed in claim 3, wherein said piezoelectric transformer body comprises said layered structure, said first electrodes being formed on the opposite side surfaces of said layered structure and being connected to said internal electrodes, said second electrode comprising at least one pair of electrodes which are formed on the side surfaces in areas different from those of said first electrodes of said layered structure and which are kept at a same potential and connected to said circuit board.

Fig 5
5. A piezoelectric transformer as claimed in claim 4, wherein a plurality of pairs of said second electrode are arranged in parallel to one another in the longitudinal direction, those electrodes in each pair of said second electrode being connected to output terminals having a same potential, and adjacent pairs of said second electrode being connected to said circuit board as output terminals different from each other.

6. A piezoelectric transformer as claimed in claim 5, wherein said piezoelectric transformer forms an inverter power supply.

Fig 6 + 7
Sub A3
7. A piezoelectric transformer as claimed in claim 3, wherein said second electrode comprises a single output electrode formed at one end of said piezoelectric transformer body, said output electrode being provided with two terminals, said two terminals being electrically connected to said circuit board.

8. A piezoelectric transformer as claimed in claim 7, wherein said first electrode comprises a pair of input electrodes formed on a part of top and bottom opposite surfaces of said piezoelectric transformer body to be opposite to each other.

9. A piezoelectric transformer as claimed in claim 8, wherein said piezoelectric transformer is used in an inverter power supply.

Fig 8
10. A piezoelectric transformer driven in a half-wavelength or a one-wavelength vibration mode, said transformer comprising a fixing member made of an elastic material having flexibility and being interposed between the piezoelectric transformer and said circuit board in order to mount said piezoelectric transformer on said circuit board, said piezoelectric transformer being fixed by said fixing member onto said circuit board, the fixing member being located within each of areas occupying 1/5 of the full length of said transformer from both ends thereof and formed in a spot-like or a linear fashion.

Fig 9
11. A piezoelectric transformer mounting structure in which a piezoelectric transformer driven in a half-wavelength or a one-wavelength mode

Add A47